

REMARKS

The courtesies extended to applicant's representative during the interview of August 1, 2005 are acknowledged with appreciation.

The Examiner objected to the specification for not providing proper antecedent basis for the claimed subject matter. Specifically, claim 14 recites "means for creating a vortex" and this term is now incorporated in the specification in newly amended paragraph [0064]. Paragraph 0061 describes the depression role in creating a vortex and paragraph 0061 states that the ramp serves the same purpose. The Examiner also rejected claim 14 as being indefinite as it was unclear which elements/structures are considered to create a vortex for the recitation "a means for creating a vortex". This rejection is also overcome by the amendment to the specification.

The Examiner rejected claim 11 as being indefinite. Specifically, the Examiner found the recitation of "a second combustion chamber" to render the claim indefinite and stated there was no recitation of a primary combustion chamber. However, the specification recites a primary combustion chamber 62 in paragraph [0034] and paragraph [0035] states that the free space between pistons 42 and 44 defines a secondary combustion chamber 72. Therefore, the claims are consistent with the description of the invention in the specification. It is respectfully requested that this rejection be withdrawn.

The Examiner rejected claims 1-4, 14 and 15 as being obvious over Savaltore et al in view of Gail. The Examiner stated that Savaltore discloses an internal combustion engine meeting all claim limitations except for the provision of a depression in the piston, the pressure formed along the edge of the piston face near

the intake port, as recited in claim 1. The Examiner relied upon Gail for disclosing this feature.

Figure 1 of Gail shows piston 17 having a depression 50. The depression does not extend to the edge of the piston as seen in the dash lines of Figure 1. As disclosed in column 9, lines 63-65, the depression 50 leaves in the radially outwardly dead center position of the piston 17 a small volume of dead space. When the pistons seen in Figure 6, there is no depression formed along the edge of the piston. This matter was discussed during the interview and the Examiner agreed that the depression is at the center of the piston, not at the edge.

Claims 13 and 16 were rejected over these two patents in further view of Alexander, Jr. The Examiner relied upon Alexander, Jr. for disclosing a flat ramp to create a vortex. As discussed during the interview, the ramp surface of Alexander is not near the intake port 8. The surface near the intake port is flat and the ramp surface 4 is proximate the exhaust outlet.


During the interview, the Examiner brought to applicant's attention U.S. Patents 2,688,320 and 2,735,416. These two patents disclose a piston head having two surfaces separated by a vertical extending wall. It is disclosed that the different levels created by the two surfaces acts as a pumping chamber. However, if the lower level of the piston face is considered a depression, it would still not be obvious to combine these teachings with the teachings of Savaltore. The teachings of these two patents cannot be combined with any patent having opposing piston faces. The action of the pump chamber created by the profile of the piston head requires a cylinder head having a similar profile as seen in Figures 1 and 2 of both patents. Unless the piston profile is used with a similarly shaped cylinder head, it is not obvious to use the piston profile alone. For that reason, it would not be obvious to

apply the teaching of either patent with an engine having opposed pistons.

The claims are allowable over the prior art and favorable action is eagerly and earnestly solicited. If any issues remain, and the Examiner believes a telephone conversation would resolve such issues, the Examiner is urged to contact the undersigned attorney.

If any fees are due and owing, the Commissioner is authorized to charge Deposit Account No. 08-2455.

Respectfully submitted,

  
Christopher J. McDonald  
Reg. No. 41,533

August 5, 2005

HOFFMAN, WASSON & GITLER, PC  
2461 South Clark Street  
Crystal Center 2 - Suite 522  
Arlington, Virginia 22202  
(703)415-0100

Attorney's Docket: A-8632.ROA/cat